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PACKING AND MARKETING FRUITS

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PACKING AND MARKETING FRUITS

How Fruits Should Be Handled to Carry to Market in Best Condition and Present Most Attractive Appearance

By F. A. WAUGH
Professor of Horticulture, Massachusetts
Agricultural College

PUBLISHED BY THE FRUIT-GROWER COMPANY
SAINT JOSEPH, MISSOURI
1905

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Publisher's Note

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The author of this little book is Prof. F. A. Waugh, of the Massachusetts Agricultural College, and formerly of Kansas. He has for many years made a special study of the fruit markets of the United States, Canada and Europe, and of all the methods employed in handling and selling fruit. He is also the author of a more extensive work on the same subject, entitled "Fruit Harvesting, Storing and Marketing," published by the Orange Judd Co., New York. We shall be happy to supply this book to those who may desire it direct from The Fruit-Grower office for $1.00, postage prepaid, which is the publishers' price.

Introductory Remarks

The buying and selling of fruit in America is largely in the hands of commission men, speculators, and others professionally engaged in the traffic, but not interested directly in fruit growing. This tendency to transfer the commercial part of the business out of the hands of the fruit-growers and into the hands of quite another set of men will probably continue to increase the difference pointed out. In other words, the business of trading in fruits belongs less to the farmers and fruit-growers than it does to the commission men, speculators, cold storage men, professional buyers, transportation men, and others of that class.

It is hardly necessary, however, to preface the following pages with an explanation that they are not addressed to the men of this latter class, even though they do have the largest interest in fruit marketing. The fruit-grower continues to have his interest in the matter, too; and it is the interest of the producer that The Fruit-Grower has first in mind. There are two other reasons why the present author does not undertake to instruct the speculators and commission men: First, they are usually quite able to take care of themselves; second, the present scribe has never studied their business from their own standpoint.

It is the plain purpose of this book, therefore, to help the fruit-grower. If anything can be done to help him in disposing of his crop at a profit the purpose of this book shall have been fully satisfied.

There can be no doubt but that the fruit-grower needs to study carefully this business of fruit marketing. It is one thing to grow good fruit, and quite another to get profitable returns from it. The difficulties are growing constantly larger and larger. The development of business continually introduces new complications. New markets have to be reached. New customers have to be consulted. New ideas in transportation are brought forward. New packages are proposed every day. New schemes are in sight everywhere. Market conditions are every day becoming more and more complex. Unless one studies the subject carefully and ceaselessly he must soon fall behind the times.

The complexity of the subject stands as one of the chief reasons why the fruit-grower should study deeply into the fundamental questions underlying the whole subject of fruit marketing. Only in this way can he properly understand the various and often surprising facts which come to his acquaintance.

A fruit-grower, to be successful in his business, must know how to grow good fruit, and he should be able to do this at a minimum cost. It is often said that good fruit sells itself, and this is true to a certain extent, so that a knowledge of fruit-growing is a first essential in fruit selling. Yet after the fruit is grown there are still two matters which the fruit-grower ought to understand in order to make his undertaking a financial success: First, he should have a broad knowledge of the general principles governing the business of trading in fruit; and second, he must be master of an infinite number of little details, every one of which is essential to complete success.

A few of these little details can be set forth in a work like this, but many of them can be learned by experience only. The main purpose and use of this little text book, from the nature of things, must be to set forth in systematic order the general principles involved. Let us understand therefore, at the outset, that it is impossible to tell everything which is important. There will still be many things for the fruit-grower to learn after he has mastered all the instructions here given. Still these instructions are none the less necessary.

It is the plan of this booklet to treat the different fruits separately, discussing picking, packing, storage, etc., for each. The apple is placed first, because it is the most important of our American fruits. Many of the methods employed in marketing apples are applicable also to other fruits, so that in subsequent chapters it will often be necessary to repeat statements already made or to refer to what has gone before. The latter alternative will usually be adopted.

The index at the back of the book will doubtless make it easy to find any information required.

The Fruit Markets

The man who expects to grow fruit for market ought to understand something about the fruit markets. There are many different markets, and they all have their peculiarities. For a proper understanding of the matter it will be best to divide these markets into two general classes: (1) the retail markets, and (2) the wholesale markets. In this country the wholesale markets are much the larger and absorb the great majority of all fruits. The retail markets are numerous and growing, however, and ought to be more commonly and more carefully cultivated.

There are great advantages in selling fruit at retail whenever the fruit-grower can do it. The expenses of freight, the charges of the commission man, and the loss by various sorts of shrinkage are all eliminated. These often amount to more than the initial price of the fruit.

In selling fruit direct to one's own customers at retail one can cultivate a much larger list of varieties. Whereas the wholesale grower is obliged to confine himself to one or two varieties, like Ben Davis or Missouri Pippin, the retail grower can sell almost any good apple. This enables him to cover a much longer season.

The mistake is often made of thinking that any sort of fruit can be sold in the home market. When one ships apples to the city markets one expects to send the best; but poorly graded, poorly colored, second class fruit will go in a country store or with country customers. One ought to remember that in these direct sales he is held personally responsible to an extent not known in the large markets. Furthermore the customer who buys a lot of apples at home in an apple country is entitled to expect something good. It is an old saying that the shoe-maker's children go barefoot; and it is an unpleasant modern illustration of it that one can buy better apples in New York than in the apple regions, or that one can get better Chicago beef in London than in Chicago. Such things ought not to be, and everybody knows they ought not. If one expects to cultivate his retail trade he must serve his country customers decently, and that means that they must have good goods.

There are many other ways of selling fruit at retail except to peddle it out on the streets of one's home village. Some men of enterprise gradually work up a list of city customers to whom they ship a certain quantity of fruit every fall. Any right-minded banker in Denver, Kansas City or Pittsburg would sooner have three barrels of fine apples fresh from the grower, whom he knows, than to get the same fruit at half the price from a commission house or groceryman in his own city. There are thousands of barrels of apples sold direct at retail in this manner every fall, and it is one of the best ways ever devised of selling fruit. "From producer to consumer direct" has long been the dream of trade; and here we have it in perfection.

Several growers and packers have recently adopted the plan of selling direct and securing their customers by magazine advertising. Almost all the leading magazines, such as Harper's, Scribner's, etc., last winter carried advertisements of growers and packers who offered to send fine Greenings, Baldwins or Jonathans by express at $3 the box.

These different methods of reaching the consumers direct are coming more and more into favor, and wherever they can be operated they should be freely tried.

The wholesale market in this country is growing to be rather complicated. It is difficult to give a comprehensive sketch of it in a small compass. Briefly we may say that the grower who has produced a crop of apples has several different methods open for disposing of his crop. The following are the most common:

1. He may sell the crop on the trees for a lump sum, say $750 for the orchard. The buyer picks, sorts and handles the fruit.

2. He may sell the crop on the trees at a fixed price per barrel. The best way is to make a straight price, say $1.35 a barrel for firsts and seconds, allowing the buyer to grade them to suit himself. Sometimes two prices are made, say $1.65 for firsts and $1 for seconds. In this case there is apt to be some difference of opinion about the grading. In either case the picking and packing may be either at the expense of the buyer or of the seller, as may be agreed.

3. He may pick, grade and barrel the fruit, and sell it to a buyer on the ground.

4. He may pick, grade and pack the stock and send it direct to a commission man, who sells it for what he can get and returns the proceeds.

5. He may place the fruit in his own storage house and sell it out during the winter whenever he thinks the market most favorable.

6. He may send his fruit to a city cold storage house, where he can rent space for 30 to 50 cents a barrel for the season, and he will then draw his fruit out and sell it (usually through a commission dealer) at any time during the winter when he thinks best.

7. He may sell his fruit on "joint account," if he can find any dealer who will go into the scheme with him . In this case the dealer pays the grower a certain fixed rate per barrel at picking time, which rate is considerably less than the probable selling price of the fruit. It may be $1 a barrel. Then the dealer takes charge of the fruit in storage and sells it off during the winter whenever he has the best opportunities. After the fruit is all sold the dealer and the grower have a final settlement. At this time the amount originally paid the grower is deducted from the net proceeds and the difference is divided equally between the dealer and the grower. This method has been found to work eminently well in a few cases, but it is not capable of wide application.

8. He may ship his fruit to a foreign market. In the case of apples this usually means Liverpool or London. These foreign shipments may be made through American agents, or direct to salesmen in the cities of final destination. Such shipments should not be made except after correspondence with the agents. During the last few years such shipments have usually paid fair prices, the net receipts being sometimes more and sometimes less than would have been secured by selling the same fruit at home. The foreign market, however, offers a splendid outlet for much of our American fruit crop, and it ought to be carefully cultivated. It is the principal market for

the Canadian crop, especially the Nova Scotia apple crop.

Every man must make his own choice between these various methods of selling. It is not possible to say that one method is better or worse than another. The greater a man's knowledge of the fruit trade and the larger his financial resources the longer he can afford to hold control of his own fruit. If he knows nothing about the business and is obliged to have some money right off to buy chewing tobacco or pay his taxes, it is probably better for him to sell the fruit on the trees or on the ground.

Picking Apples

It is a delicate question to determine just when apples ought to be picked. There are some reasons why it is desirable to pick as early as possible. Early picking reduces the danger from wind storms and saves considerable loss from windfalls under all circumstances. On the other hand, apples color up best when they are left comparatively long on the trees. Many varieties do not color thoroughly until after the leaves thin out considerably. Some varieties can be left to advantage long after the first frost. This depends a good deal, of course, on the variety itself and its habit of holding onto the tree. Northern Spy and Ben Davis hold on extremely late, while Wealthy and Wagener are apt to fall as soon as they are ripe, or even before.

If apples are to be sent to storage another factor comes into consideration in determining the proper time for picking. It used to be thought that apples should be picked before they were mature in order to have them hold well in cold storage. The extensive experiments of the Department of Agriculture in recent years have shown that this idea is wrong. Nearly all varieties stand cold storage best if thoroughly ripe and well colored, but not overripe. Such varieties as are subject to scald should be given special attention in this respect, as it is found that the scald is worse on apples picked before maturity. Thoroughly ripe apples, well colored, are not nearly so much subject to scald as are green, uncolored specimens.

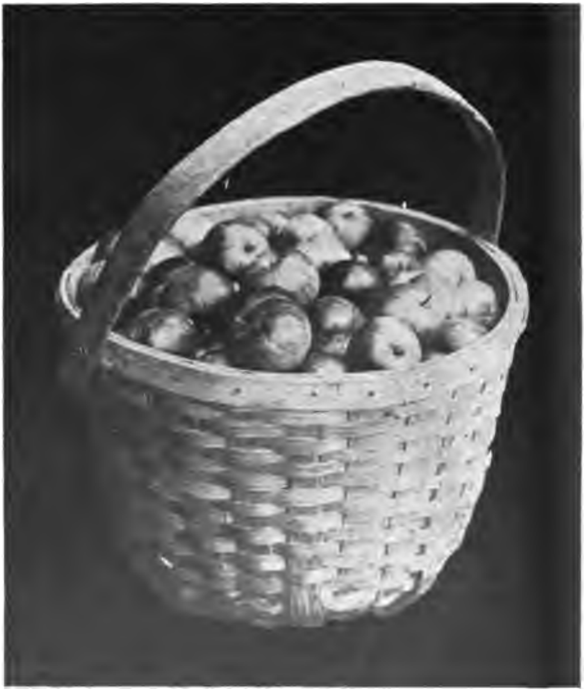
The importance of having the fruit nicely colored and ripened when picked is so great that many of the best growers who make a specialty of fancy grades have adopted the practice of picking the apple trees over two, three, or even four times. At each picking they take off such fruit as is ripe, well colored, and up to size. The rest of the apples are allowed to hang, and it is found that they will increase greatly in size toward the end of the season and will color up and otherwise improve long after the first lot would have fallen to the ground. Of course this method of picking over the trees several times would be too expensive with cheap fruit and with all poorer grades of apples. It is strongly recommended, however, for early varieties and fancy grades.

There have been all sorts of mechanical pickers advertised, but none of them has ever become popular. They are of two kinds. The first kind is intended to pick a single apple at a time out of the higher branches, and consists of some sort of a pocket hung on the end of a long pole. These contrivances are too slow and cumbersome for any commercial work. The second style of apple picker presents some modification of the old practice of shaking apples off the trees. It furnishes some kind of a spread held under the branches, upon which the apples are shaken down. While this method is cheap enough to make it commercially available, it is too rough for the exacting demands of present-day business. By all means the best way of putting up commercial apples is to pick them by hand from the trees.

There is something of a knack in picking apples, but unfortunately expert apple pickers are not often to be hired. The fruit-grower is usually obliged to put up with ordinary day labor and to make up in the carefulness of his own supervision the lack of experience on the part of the pickers. Apple pickers usually get the prevailing day wages, that is from one dollar to one dollar and seventy-five cents a day. Apples are sometimes picked by the bushel or barrel, but this practice is not common and is not to be recommended. When it is indulged in, the price paid is from eight to fifteen cents a barrel. The writer has recently been told, on pretty good authority, of a picker who picked one hundred barrels of apples from the trees in one day. Any such slam-banging work as that ought to be prohibited in any well regulated orchard. The ordinary picker will pick from twelve to twenty barrels a day.

Apples should be picked with the stems on and not torn from the trees. Where the stem is pulled out of the apple, the skin is usually broken and an opportunity for decay given.

Some pickers prefer to pick into a sack tied over the shoulder. The best contrivance, however, is undoubtedly the swinging-bail half-bushel basket. This is made in various styles, usually of oak or elm splints. These baskets are now used in such large quantities that they can be bought at very reasonable prices. If fine fruit is to be handled with special care, it is worth while to have the baskets padded inside. Each basket should be furnished with a hook made by bending a strong three-eighths inch wire into the form of a very crooked S. This can be hooked over the limb of the tree so as to leave the



Swing-bail Half-bushel Basket

picker free to use both hands. When the picking is being done in large trees this same hook allows the basket to be let down to the ground by a strap or rope, where it is emptied by an assistant, thus making it unnecessary for the picker to climb up and down the tree for every basketful.

Picking is greatly expedited by the use of suitable ladders. The best ones are of two forms. The first form is the step ladder, which should always have three legs instead of four. These step ladders are made in large quantities now for this particular kind of work. It is probably cheapest to buy ready-made ladders if any considerable number is wanted. Of course, any handy man can make one or two such step ladders if that is more convenient than to buy them.

The second type of ladder used in apple picking is adapted for taller trees. It is of the ordinary form, that is with two rails. Very often the two rails are brought together at the top, making the top pointed. This makes it easier to adjust the ladder securely into or against the top of the large apple tree. This ladder should also be as light and strong as possible. They are made in large numbers and sold at low prices.

Various practices prevail with regard to the immediate disposal of apples when they are taken from the trees. Sometimes they are placed in piles on the ground. Sometimes they are put into barrels without sorting and left in the orchard; sometimes they are put unsorted into barrels and carried to the temporary storage house; sometimes they are immediately sorted, barreled, headed up, and sent to storage. If the stock is going to cold storage, which is now the customary method, the last named plan of handling the fruit is undoubtedly the best. It certainly is a mistake in all cases to leave the fruit on the ground even for a few hours. If there is good storage at home and handy by, it is a very good practice to put the apples into barrels unsorted and take them immediately to the storage house, where they can be sorted and packed more at leisure. Under all circumstances, however, they ought to be put into as cool a place as possible with the least possible delay. In handling fancy grades of stock in barrels, it is probably best to pick the fruit, sort, pack and head it up at once and put it immediately into cold refrigerator cars, sending these off as expeditiously as possible to the cold storage plant. This method is actually practiced on a large scale by some of the best growers. There is no extraordinary expense in it, in fact nothing out of common except the expense of the refrigerator cars, which has been shown to be entirely profitable with good fruit.

When apples are taken to the temporary storage houses without sorting, it is best to grade them over as soon as convenient. This is more necessary if the grade of the fruit is low. If there is considerable fungus, they should be sorted at once, all first-grade fruit being put by itself. In case the fruit comes from the trees in extra good condition, with no fungus and very few culls, there is not so much urgency in this early sorting. In general, however, it is a mistake to leave the fruit ungraded, as is sometimes done, up to the time when it is sent to market, which may be late in the spring.

Sorting Apples

The grading of the fruit is extremely important from every point of view. There is hardly anything which affects the price secured more than this. Many fine apples bring outrageously low prices because they are carelessly, ignorantly, or deceitfully graded and packed.

Proper grading requires good judgment and considerable experience. The man who sorts and packs the fruit should be the expert of the gang. The manager can afford to pay him good wages, although as a matter of fact such men rarely secure more than two dollars a day.

We have already recommended that the sorting be done immediately after the fruit is picked, either in the field or in the temporary storage house. Some men spread the fruit on the ground for sorting. It is a good deal better to have sorting tables, which should be three feet wide and six to eight feet long. They should be eight inches deep and should be put on trestles or legs so as to stand about three feet four inches from the ground. It is good policy to have the bottom and sides padded to prevent bruising of the fruit. We have frequently seen the bottoms made with slats, the idea being to allow the leaves and other rubbish to sift through. This is not a good practical construction. In the first place it weakens the bottom, and in the second place these slats are always inclined to bruise the fruit more or less. It is easy enough to dispose of the rubbish in some other way.

On the table like that here described from two to four barrels of fruit can be spread out at once. It is desirable to have a considerable quantity of fruit within the reach of the man who is sorting in order that he may work rapidly and secure a uniform grade.

Some of these sorting tables are made with a chute or spout at one end, usually furnished with a cloth spout leading into the barrel, through which the apples are allowed to run. If managed with some care the apples can be handled in this way without severe bruising. In the judgment of the writer it is much better, however, to sort the apples into baskets. These should be of the kind already described for picking. The half-bushel swinging-bail basket can be let down into the barrel and the fruit poured out with a minimum of bruising.

It is desirable that sorting be done as much as possible by one man. Frequent shifting about on this job always gives an uneven grading of fruit.

The question of whether a certain apple should be put into the first or into the second grade is largely a matter of judgment in the end. It depends also upon the run of the lot. If the apples are all running large, then medium sized specimens should be put among the seconds. In other words, it is more important that a barrel of apples should be uniform in size than that they should attain any particular size. The question is relative rather than absolute.

Nevertheless the Apple Shippers' Association has adopted a rule, which is departed from when necessary, and which is enforced in critical cases. Their rule is as follows:

The standard for size for No. 1 apples shall be not less than 2½ inches in diameter, and shall include such varieties as Ben Davis, Willow Twig, Baldwin, Greening, and other varieties kindred in size. The standard for such varieties as Romanite, Russet, Winesap, Jonathan, Missouri Pippin, and other varieties kindred in size shall not be less than 2¼ inches. And, further, No. 1 apples shall be at time of packing practically free from the action of worms, defacement of surface, or breaking of skin; shall be hand picked from the tree, a bright and normal color and shapely form.

No. 2 apples shall be hand picked from the tree; shall not be smaller than 2¼ inches in diameter. The skin must not be broken or the apple bruised. The grade must be faced and packed with as much care as No. 1 fruit.

The Apple Barrel

Before going on to see how apples are packed, it will be best to stop a moment to consider the standard apple packages. Of these the barrel stands first.

The standard American apple barrel has the following dimensions: diameter at top, 17¼ inches; circumference at middle, 64 inches; length of staves, 28½ inches. This is known everywhere as the standard apple barrel, or the one hundred quart barrel.

In Nova Scotia, and occasionally in Ontario, another barrel is used considerably different from the one just described. It is just a trifle longer, but the most distinctive difference lies in the fact that the staves are straighter. The barrel is made nearly cylindrical. The dimensions of the Nova Scotia barrel are: diameter of top, 17½ inches; diameter at middle, 19 inches; length of staves, 29 inches. The two barrels may be more readily compared in the following table:

COMPARISON OF NOVA SCOTIA AND AMERICAN APPLE BARRELS

	Diameter at Top	Diameter at Middle	Length of Staves	Capacity
American..........	17¼	20⅛	28½	100 Quarts
Nova Scotia.......	17½	19	29	96 Quarts

The American apple barrel is a stronger package than the Nova Scotia barrel and will stand rough handling, such as loading on and off cars and trucks, better than the straight stave barrel. When it comes to shipping by boat across the Atlantic, however, the Nova Scotia barrel has the call. This is because the longer straighter barrel, when stowed on its side on shipboard, does not rock so much as the barrel with bended staves. It therefore keeps the fruit in better condition in going across.

There is, of course, a certain advantage to the grower in using a ninety-six quart barrel in place of a one hundred quart barrel. Four quarts of apples are worth saving. At this rate a man would gain one barrel in twenty-five, which would be a saving of four per cent. In most factories any adjustment which accomplishes a saving of four per cent is considered well worth making. A smaller barrel furnishes an even three bushels, which is all the purchaser is really entitled to. The question of adopting the ninety-six quart barrel in the United States has often been discussed, but the proposition has never made much headway. It will doubtless be a long time before we ever come to it.

Apple barrels are made out of all sorts of lumber, usually from such timber as is not very valuable for other purposes. Elm is used to a considerable extent and makes a good barrel. Hickory used to be used, but it is now too expensive. Hemlock and spruce are used to some extent; so is cheap pine. Chestnut and birch are occasionally worked up into barrels. The hoops are usually made out of the same stock, although occasionally timber is worked up into hoop stock which is not fit for anything else. In some parts of the country split hoops are used, in which case young birches and large alders are worked up.

The best custom for one buying apple barrels is to get them knocked down, staves, heads and hoops separate. It is best, of course, to buy this stock in car lots. It is then delivered on the farm of the grower to be worked up into barrels on the premises. A small cooper shop can be easily rigged up. In the apple growing sections itinerant coopers go about from farm to farm during the summer and autumn working this stock up into barrels. A good handy man on the farm, with a little practice, can learn to put up apple barrels himself. A small kit of tools is required, but nothing very elaborate or expensive. The apple barrels made up in this way cost all the way from fifteen to thirty-five cents each, depending very largely, of course, on the original cost of the stock. During the last two years stock has been very scarce and high, owing, it is said, to the operation of a barrel trust. At present the production of barrel stock seems to be catching up with the demand, and the tendency is toward easier prices.

In many places it is customary to use second-hand barrels for packing apples. The common flour barrels are the ones usually impressed into this service. A common flour barrel has the same capacity and dimensions as the standard apple barrel, and answers the purpose fairly well. However, a second-hand barrel can never be made to look as good as new. In many cases dirty barrels are bought and are used without proper cleaning. In such cases they detract greatly from the appearance of the fruit, and the commission man knocks off on the price accordingly. The apple grower who has a considerable crop to handle cannot afford to bother with flour barrels. He should by all means use fresh-made apple barrels.

Apple Boxes

During recent years there has been a good deal of discussion as to the merits of the apple box. Many growers believe that there is a future for apples packed in this way. While the use of the box has been strenuously objected to in some quarters, especially by the commission men and fruit dealers, it has not always been clear that their advice was disinterested. In fact, it is common knowledge that in some cases they have bought apples in barrels and repacked them in boxes, making quite a profit for themselves thereby. The writer feels justified in relating here an item of personal experience. Two years ago we had some Gravenstein, McIntosh and Fameuse apples ready for market in October. We wrote to the commission men with whom we were doing business at that time—a thoroughly reliable firm, by the way—asking them if they would advise us shipping in boxes. Their reply was about as follows: "The fruit is yours. You can do as you please with it. Our advice would be, however, not to use any boxes." Inasmuch as we were anxious to learn how the fruit would handle, and as we had the boxes on hand, we divided the shipment, sending one-half in barrels and one-half in boxes. The fruit was all of the same grade, but that in boxes was wrapped in paper. The whole lot was sent to the commission man whose advice has just been quoted. When the returns came back we found that the barrels had sold for $2 each, which was the top quotation at the time; but the boxes had also sold for $2 each. In other words, one bushel of apples nicely wrapped and packed in boxes brought just as much as three bushels of the same fruit in a barrel.

The three boxes cost 45 cents. A barrel at that time was worth 35 to 40 cents. A little more time was consumed in packing the three boxes than in packing one barrel. The cost of the paper wrapping may be fairly disregarded.

The great advantage of the box lies not so much in the fact that it displays the fruit to better advantage, for it does not always do so, but in the fact that it presents a quantity of fruit which many consumers prefer to purchase. There are very few city families who find it convenient or economical to buy a barrel at one time. The quantity is more than the family will consume without waste, and there is no place in the house where there is room for the barrel to stand. A bushel of apples, however, is not too much for the smallest family, and a neat square box can be easily stowed even in a New York City flat.

Experience has demonstrated that the apple box has come to stay . It is bound to be used, and its use will be extended. This does not mean, however, that it will supplant the apple barrel. It certainly will not do so, at least for many years to come. The apple box must be used only for fancy grades of fruit. This is not so much because the package costs more, as because the expense of selling it is somewhat greater and because the person buying a package of this kind expects it to contain something good. If the purchaser buys a box of apples and finds the fruit inferior, his resentment is much greater than if he has been cheated on a barrel of apples. Most purchasers have grown accustomed to being more or less swindled on apples in barrels.

A great many different boxes have been proposed. These have been of different sizes, different forms, and differently constructed. We seem to be settling down rather rapidly, however, to a bushel box of standard size and construction. This box, which is now the most common, has the following inside dimensions: 10x11x20 inches. This gives a capacity of 2,200 cubic inches. A standard bushel contains 2150.42 cubic inches, so that the box furnishes a little over the standard struck bushel (not a heaping bushel).

A somewhat larger box is rather commonly used in Canada, but it is not to be recommended.

These boxes are made with the ends of three-quarter inch stuff, and with the top, bottom and sides of lighter stuff. These last may run anywhere from one-quarter to one-half inch, but three-eighths-inch stuff is about right.

There have been some experiments recently with smaller boxes, especially with half bushel sizes. The writer feels confident that something of this kind will eventually find a place in the market, but nothing yet has been accomplished which can be given general recommendation.

The bushel basket has been used to some extent, especially in the Chicago market, for apples, and has some advantages. It is easy to handle and pleases the customer. Such bushel baskets with covers cost about $12 a hundred. Half bushel baskets of the same form cost from $10 to $11 a hundred.

Packing Apples

A man who packs apples should have some experience, and the judgment born of it, in order to do his work well. Next to the man who grades the fruit, the one who packs it has the greatest responsibility. Many a sale of good fruit has been spoiled by poor packing . When fruit is to be shipped some distance, as across the ocean, the packing must be irreproachable. If barrels are poorly packed the fruit works loose, becomes bruised, and in many instances quite worthless.

In packing a barrel with apples the barrel is placed on its head with the bottom out. Some good clean apples are put in for "facers." It is best to pour in 20 to 30 such apples at the start—just about enough to cover the head. The packer then places these in even circular rows, beginning around the outside and working in, setting each specimen with the stem down. It is important to see that the apples in this first tier—the facers—fit snugly together. Then a second tier is put on, facing stems down like the first. Now the real filling of the barrel begins. The sorted fruit, preferably placed in the swing-bail half-bushel basket already recommended, is poured in. This basket can be let down into the barrel and emptied with the least possible disturbance of the faced layers. After each half bushel of loose fruit has been poured in the barrel should be vigorously shaken. This shaking is essential. It settles the fruit together, and prevents the otherwise disastrous loosening when the barrel is shipped. When the barrel is practically full the top layer (which will be the bottom layer after the barrel is packed), is faced stems out in as neat a manner as possible. When the apples are all in and this last layer of facers on, the fruit should stand up two or three inches above the top of the barrel.

The head (or what is really the bottom of the barrel) is then put in place. A barrel press is now necessary. There are two types of barrel press in common use—the screw and the lever press. The writer prefers the latter. With either one the heading proceeds in the same manner. The upper hoops of the barrel are slightly loosened. The head is pressed down even with the chines, the hoops are driven home, and some sort of cleat is tacked in to help hold the head in place.

The barrel is then marked with the stencil of the grower or packer, and with the name of the variety and grade. Sometimes it is also marked with the name of the dealer to whom it is to be shipped. It is then ready for delivery, either to the buyer or to the storage house.

In packing apples in boxes the fruit is all put in by hand, especially when it is to be wrapped in paper. Care must be taken to get the boxes full. It is even harder to make a box of apples full and tight than a barrel. Some shippers cover the packed fruit with paper and make it solid by putting in a quantity of excelsior next to the cover. This is practiced more especially when sending boxes across the ocean, but is not to be generally recommended.

When apples are nicely packed in boxes they should go in in rows and tiers just as oranges are packed. On the Pacific Coast, where all these tricks are better understood than on this side of the Great Divide, they do this think excellently well. Mr. E. C. Dickerson of North Yakima, Wash., in the October, 1904, number of The Fruit-Grower told how they do it there. Here is his description:

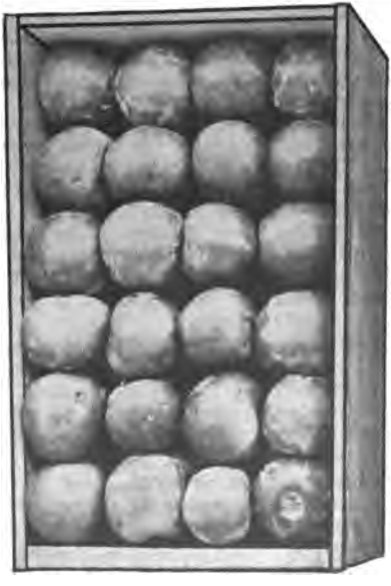


Fig. 1.

There are some thirty or forty sizes of apples, covering all the varieties and their various sizes or grades, which can be packed into the standard apple box in thirty or forty different styles. For commercial packing and shipping requirements most of the

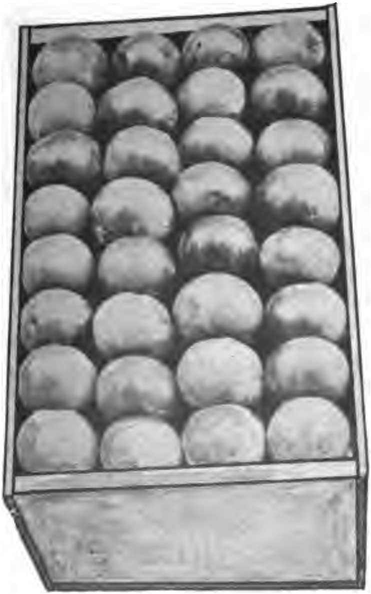


Fig. 2.

ordinary grades of apples grown can be handled in seven or eight different styles of packing, of which six different styles are shown and described below.

Figure 1 shows a four-row box of apples. This box is the largest sized apple that can be packed into the four-row grade. The box contains just ninety-six apples. There are nine grades of the four-row apple, the smaller of which is shown in Figure 2 and contains 128 apples. Every layer in this box of 128 is packed in the same manner as that shown by the top layer. In the box containing ninety-six the width

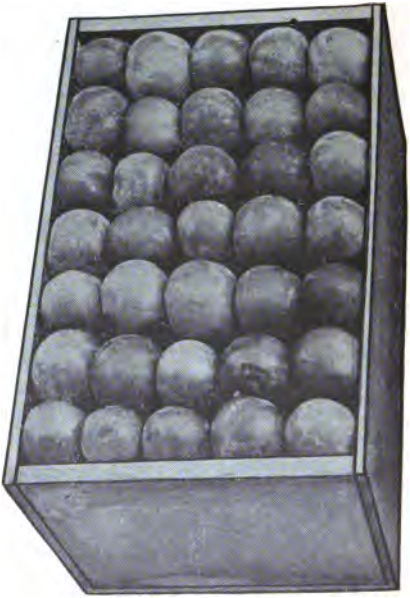


Fig. 3.

is too great to allow of their cheeks being all turned up, so in the layers below, according to the size of the apples, one or more of the layers are placed stem down.

Figure 3 shows the largest apples that can be packed into the five-row grade. The box contains just 140 specimens. This grade cannot be packed with a long and narrow apple, as there must be four layers in this box.

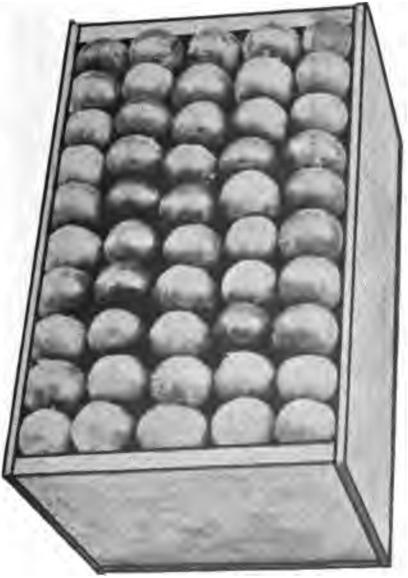


Fig. 4.

Figure 4 shows the smallest five-row apple that can be packed in this grade. The box contains five layers and 250 apples. All the layers in this grade are placed in the same manner as shown in the top layer. This grade cannot be packed with a long apple. The five-row grades, which are sometimes called straight fives, are found in twenty-three dif-

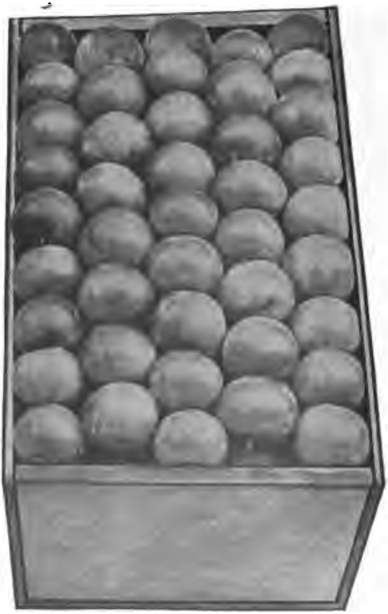


Fig. 5.

ferent grades reaching from 140 down to 250 specimens in each box.

Figure 5 shows an odd grade of five-row apples. Without this style of a pack it is almost impossible

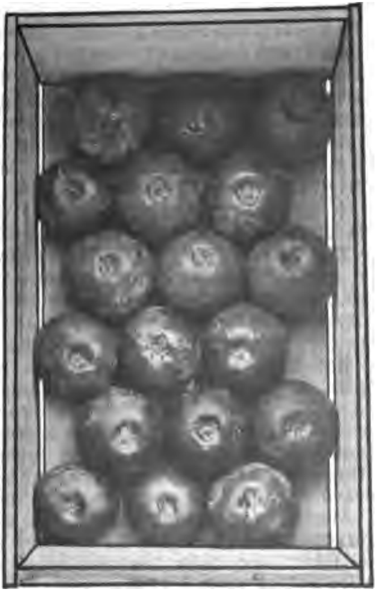


Fig. 6.

to pack all the apples from your orchard and have them all packed neatly and correctly. The box shown in Figure 5 contains 213 apples. In this grade the center of every apple in the third and fifth layers comes directly over the center of its corresponding apple in the first layer. The center of every apple in the fourth layer comes directly over the center of its mate in the second layer. There are three grades of this style. In one the first row will contain eight apples, the second seven, the third eight again and then seven and eight, making a total of 188 apples in the box. In the second grade of this style, the first, last and every row will contain eight apples with the box holding just 200 specimens. In the third grade of this style the first, third and fifth rows will contain nine apples, while the second and fourth will contain only eight, making the box hold 213 apples.

The sixth and last style of packing shown is represented by Figure 6. This box will contain seventy-two apples. Only the first of its four layers is shown. The core of all apples in the third layer will come directly over their mates in the first layer, but not over the cores of any apples in the second layer.

Nothing has been said of the various grades of six-row apples, as they are too small to offer to the apple-eating public, though some pack and ship them to the penny fruit stands. The top layers of the apples in any of the grades must be high enough that when the cover is nailed on, the cover will touch each and every apple in that layer and touch it hard enough to compel every apple in the box to remain in touch with its neighbor apple in the box, the walls of the box itself, or both, as the case may be. throughout its entire period of transportation.

When a box is finished packed the apples at the end of the box must not be more than an inch above the top of the box, while the center of the box should be from one to two inches higher, so as to make a beautiful curve for the top of the box, which helps to hold the apples in the box together more snugly. Though every person has not the gift for the making of a good apple packer, most of them after a careful reading of the above can after more or less practice succeed in packing neatly and rapidly. But remember practice makes perfect. In box apple packing rapidity and perfection do not go hand in hand.

Apple Storage

The storage of apples presents one of the largest factors in the modern apple business, because the bulk of the trade is with winter fruit, which is always stored for a greater or less period. Even from the first there has been some storage. In olden days apples used to be stored in piles in the orchard, in pits in the ground, in bulk in the hay mow, in bins in the cellar, and in various other ways. Nearly all of these old-fashioned ways are still practiced to some extent, although they have very little influence on the modern apple business.

Following these crude methods of storage there came into practice a few years ago different methods of handling apples in specially made storage houses. At the beginning these were seldom or never supplied with artificial refrigeration. The theory of construction was simply to provide a well insulated wall and then to cool down the storage chamber by ventilation. Such houses or storage compartments are no wall classed together under the name "common storage." "Common storage" is distinguished from "cold storage," the latter referring to such houses or chambers as are supplied with artificial refrigeration.

There has been a strong tendency in the last few years to do away with the common storage in favor of the genuine cold storage. Great improvements have undoubtedly been made in the process of cold storage, and the matter is much better understood than it was a few years ago. Such storage is therefore both safer and cheaper. Nevertheless the common storage has not altogether gone out of use. One of the largest dealers in New York State—a man of wide practical experience in all systems of storage—recently told the writer that he would as soon have apples in common storage as in the best cold storage.

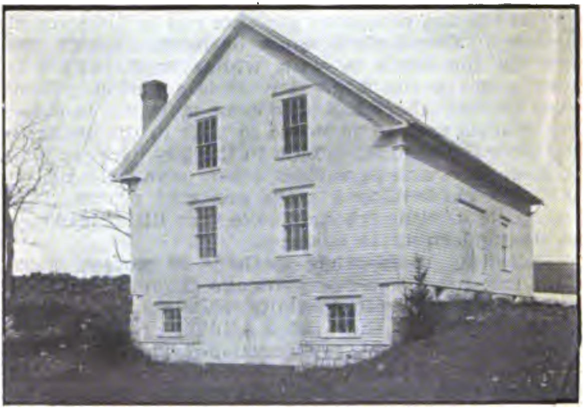


Fig. 7—Mr. Green's Storage House

This is perhaps an extreme view, but it shows that the difference between the two systems is not so great as we have sometimes been led to believe.

The construction of a house for common storage may best be understood by examining one of two concrete cases. Figure 7 represents the storage house of Mr. Charles L. Green, East Wilton, Maine, which was built in 1903. This building is 30x40 feet, with

12 foot posts upon the sills. It also has a cellar or lower story dug out of a gravel bank and facing toward the south. There is a large door to this basement story so that a load of apples can be backed in without unloading. The cellar walls are built of quarried granite laid solid in cement. The underpinning is of granite laid in Portland cement and lined with brick . The basement will hold one thousand barrels, and the first floor will hold approximately the same amount.

The building is sheathed on the outside with matched hemlock covered with thick sheathing paper and this in turn covered with clapboards and well painted. The studding were also sheathed again inside and then a new course of studding set around inside of the first and sheathed again. This gives two dead air spaces and three matched sheathings besides the paper, clapboards and paint. The floor between the storage room and cellar is double, with hemlock for the under course and matched birch on top with heavy paper between. Both storage rooms have double doors and windows with matched board blinds inside. There is an attic room which will accommodate twelve hundred empty barrels. The building cost twelve hundred dollars.

Another very excellent building for the common storage of apples which has been frequently described and which is certainly a model of its kind is that shown in figure 8, and owned by Mr. T. L. Kinney, South Hero, Vermont. This house was built in 1888 and stands 30x50 feet on the ground. It has a basement which will accommodate 1,000 barrels, and the main floor will receive an equal number. There is an attic for the storage of empty barrels, cooper's stock, etc. The walls are constructed in the following manner: The studding are 3x4 inches. On the outside is a course of one-inch matched pine covered with building paper and again with clapboards. On the sides of the studs small furring strips are run in. Upon these a lath and plaster coat is made from stud to stud. This produces a double dead air space. On the inside of the stud is another one-inch course of matched pine covered by building paper and by one-half-inch boards all over the inside. There are glass windows and heavy matched board blinds. This house cost fifteen hundred dollars and has been entirely successful.

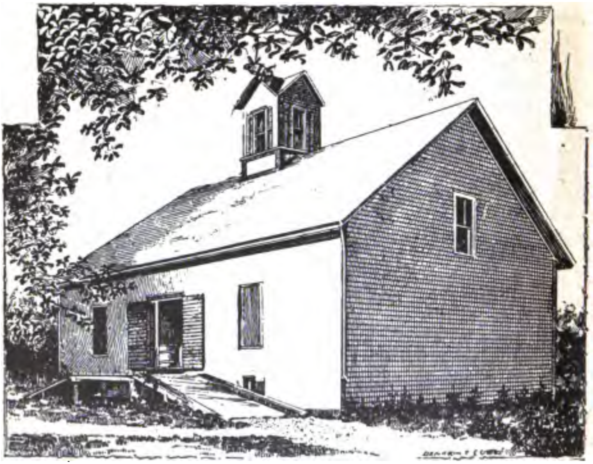


Fig. 8—Mr. T. L. Kinney's Storage House

Various other houses more or less like the two here described have been built in all parts of the country. So far as the writer knows these have proved uniformly successful in the northern states where they have been well built and intelligently managed. In the southern states they are less satisfactory, and in any case they are unreliable when mismanaged.

The two important things to be looked after in building these houses for common storage are (1) insulation, and (2) ventilation.

Insulation is provided as described above by making very tight walls with dead air spaces. Formerly it was recommended to fill the spaces with sawdust or some similar material. This is now known to be inadvisable.

Ventilation should be secured by having a reasonable number of windows which may be easily opened and shut. These should be near the floor or else special ventilators should be provided at the floor level, opening in all sides of the building. An adequate discharge for warm air must also be provided for from the upper part of the storage room. This is usually secured by ventilating shafts running from the storage room to the roof. A circulation of air can be secured at critical times with this construction by lighting a lamp and placing it on a small shelf in the ventilating shaft. The windows of such storage houses are opened at night when the temperature is low and are closed early in the morning before the thermometer goes up. In this way a storage house can be thoroughly cooled off and can be held at a very uniform temperature when once it is cooled . Of course the cooling is not so positive as with artificial refrigeration, nor can it be so quickly accomplished.

The construction of cold storage houses with artificial refrigeration is rather a complicated matter, which even the refrigeration engineers do not understand any too well. It would be going too far to take up that matter here, especially as very few apple growers ever undertake to build such storage houses.

The ordinary practice in dealing with cold storage is for the grower or buyer of the apples to send them to a refrigerating house in the city. Space in these houses is rented. The ordinary price is from thirty to fifty cents a barrel for the season. A certain temperature is guaranteed. The apples may then be removed whenever the owner desires.

It should be clearly understood by everyone who undertakes the cold storage of apples that the function of the storage house is merely to maintain a uniform temperature of a desired degree throughout the compartment and during the storage season. Cold storage will not make number one fruit out of number two; nor will it altogether prevent the natural process of deterioration. It simply checks the ordinary processes of decay. It appears that many persons have expected too much of cold storage in the past.

While it is not necessary for the apple grower to know about the different systems of mechanical refrigeration, it is, nevertheless, a matter of considerable interest to him. Storage rooms are sometimes cooled directly with ice, although the direct cooling systems are not in very common use. Usually the rooms are cooled by the evaporation of the liquid gases. This gas is allowed to evaporate in or near the storage room and during its evaporation it takes up the heat from the room or fruit stored in it, thereby lowering the temperature.

The following description of the methods usually employed is taken from Mr. G. Harold Powell's bulletin entitled "The Apple in Cold Storage."

The refrigerating gases generally used are anhydrous ammonia, sulphuric acid, and carbonic acid (also known as carbon anhydrid and carbon dioxid).

The cold temperature in the warehouses is usually produced by either of two methods, commonly known as the compression and the absorption systems.

The compression system takes its name from the fact that the refrigerating gas—whether ammonia, carbonic acid, or sulphuric acid—is first compressed in a machine called a compressor. Heat is generated by the compression; the gas is then cooled and condensed in pipes or coils called the condenser, either immersed in water or having water running over them, and this converts the gas into a liquid. The liquefied gas then passes an expansion valve to pipes or coils called the refrigerator cooling coils or cooler, where it is evaporated by the heat which is withdrawn from the surroundings. The gas formed by the evaporation of the liquid returns to the compressor, is again condensed, then re-evaporated, and the cycle of refrigeration is repeated over and over.

In the absorption system the gas is obtained by heating strong aqua ammonia in a still, thereby driving off the ammonia gas. The gas is then reduced in a condenser to a liquid in a manner similar to the compression system. The liquefied ammonia produces refrigeration by evaporating in the cooling coils, and the gas is then absorbed by weak aqua ammonia in coils called an absorber. The resulting strong liquor is then pumped back to the still. The cycle of refrigeration is repeated continuously, and consists, first, in the generation of a gas by heating strong aqua ammonia in a still; second, in condensing the gas which is deposited from the water to a liquid in the condenser coils; third, in its evaporation to a gas in the cooling or refrigerator coils; fourth, in its absorption by the weak aqua ammonia in the absorber; and fifth, the ammonia liquor is piped to the still and redistilled.

There are three general methods of producing the desired temperatures in cold-storage rooms, and these are known as the direct-expansion, the brine-circulating, and the indirect or air-circulating systems. All three systems may be used in a cold-storage plant, and in a given room or compartment the air-circulating system is sometimes used in connection with the brine or the direct-expansion systems.

In the direct-expansion system the liquefied gas evaporates directly in the cooling refrigerator coils or pipes which are placed in the refrigerator rooms. The heat used in the evaporation of the gas is absorbed from the room or from its contents, and the temperature is thereby reduced. The gas then returns to the compressor in the compression system, or to the absorber in the absorption system, and after being distilled in the latter case begins the refrigerating cycle anew.

In the brine-circulating system, the liquefied gas, instead of evaporating directly in coils in the storage room, evaporates in pipes surrounded by brine, or in a brine cooler. The heat used in the evaporation of the gas is absorbed from the brine rather than from the room and its contents, as in the direct-expansion system. The cold brine is then pumped to coils in the storage room and the heat of the room and its contents is absorbed by the cold brine. The warm brine is then returned to the tank or cooler from which it started and is recooled, while the gas returns to the condenser or to the absorber to renew the cycle of refrigeration.

In the indirect or air-circulating system the air in a well-insulated room, which is sometimes called a coil room or a "bunker room," is first cooled, either by the direct-expansion or by the brine-circulating system. The cold air of the coil room is then forced through ducts to the storage rooms. After passing through the storage rooms it is returned by ducts to the coil room to be recooled and purified and to begin the circuit anew.

There are many modifications in the details of these systems when applied to storage houses, but as this publication does not deal primarily with the engineering side of refrigeration it is the purpose to set forth approximately the fundamental principles on which the most common storage systems are based rather than to discuss their application or their respective merits.

Extensive experiments in the cold storage of fruit, especially apples, carried on by the United States Department of Agriculture under the supervision of Mr. G. Harold Powell, have added materially to our knowledge of the subject in recent years. These experiments have strongly emphasized the importance of immediate storage. The fruit should be put into the storage room with the least possible delay after picking. Indeed, we know of one large apple grower who has cooled refrigerator cars standing on the railroad track waiting before picking begins. Just as fast as the fruit can be sorted it is barreled and hauled directly into these refrigerator cars. These cars are run right into the refrigerating house to be unloaded, so that the apples are out of cold storage for only a few hours at most, from the time they are picked until they are sold.

It used to be thought that a temperature of 40 to 42 degrees was best for storing apples, but recent experience has shown conclusively that the temperature in the storage chamber should be 31 or 32 degrees, and that this should be maintained with the least possible variation throughout the storage season.

There is a diversity of custom with respect to putting up the apples for storage. Usually they are stored in barrels, but the reason for this is often that the fruit handles more easily rather than that men have any notion that the apples will keep better when put up in that way. In fact, a good many fruit-growers who practice home storage of apples habitually store the fruit in bins. This is not the best method . In fact, it may fairly be questioned whether storage in bins is ever good practice. If fruit is to be stored for a short time only it is better to have it in a small package. If the package is open or ventilated, so much the better. The cold air reaches all parts of the receptacle and cools off all the fruit. If apples are to remain some time in storage, however, it is better to have them in closed packages. Probably the best that can be done is to have them headed up in barrels. In open packages the fruit is liable to be injured by wilting.

Wrapping of the fruit in papers as it is put into the package nearly always helps it to keep better. It extends the life of apples in storage, under favorable conditions, a month or more.

A word ought to be said in this connection with regard to the scald. This is a malady which appears badly on stored fruit sometimes, especially in certain varieties, such as Rhode Island Greening. It seems to show worse on fruit that is picked before it is well colored and thoroughly ripe. A warm temperature in the storage room also tends to promote the development of the scald.

Peaches

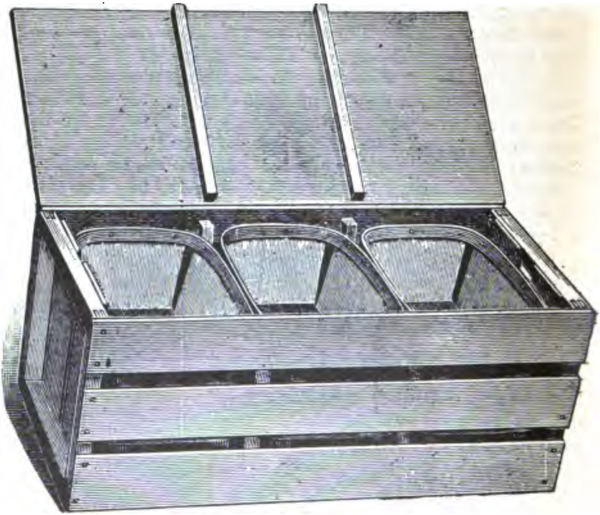
It requires exceedingly nice judgment to know just when to pick a peach for market. For eating out of hand a peach should be picked early in the morning, just about sunrise, of that day when it is so ripe that it would fall to the ground if left till noon. Unfortunately this good, though somewhat impracticable, rule cannot be applied in picking peaches for market. Especially when peaches have to be shipped a thousand miles or more, and must lie in the packages some ten days or two weeks between the orchard and the table where they are eaten, it is manifestly impossible to ripen them thoroughly on the trees. The ideal, of course, is to leave them on the trees just as long as possible, and still get them to the consumer without prejudice. This means that the nearer the market the riper the fruit may be allowed to become, while the farther away is the market the greener the fruit must be picked.

It is undeniable that mistakes are made every year on both sides. Some fruit is picked too soft and some is sent to market too green. The consumers, at least, see more of the latter mistake, and it seems to be fair to urge on shippers at the present day the propriety of ripening their peaches better before shipping. Nothing but long, and probably expensive, experience can determine just what stage of maturity is best. This varies also with different varieties and with the weather. Some varieties, like Elberta, can be allowed to ripen considerably further than other softer varieties, like Carman. In hot, muggy weather the fruit has to be picked greener to prevent the spread of rot.

The fruit should be picked as early in the morning as possible. This is a good rule anywhere. It is especially important for fruit which is to stand long shipment.

The half-bushel basket with swinging handle is best for picking peaches. There is hardly any exception to this statement .

Peach pickers nearly always work by the day. If the picking is to be done by the basket the price will have to be agreed on in each case. There is no recog-



Georgia Peach Carrier

nized price for this work, like there is for picking strawberries in the strawberry sections.

There are several different packages regularly used for peaches, but three types are much the most common. These are as follows:

The Georgia carrier, or six-basket crate. This crate holds six four-quart baskets. The baskets are made of light veneer and are without handles. Three of these side by side, cover the bottom of the light slat crate. A light slat staging is laid on top of the three bottom baskets as soon as they are put in, and three more baskets go on top. The cover is then nailed or stapled on, the crate is marked with the name of the variety and grade, and the package is ready for the car.

The Jersey basket. This is a slat basket made in the form of the inverted frustum of a cone. In other words, it is a round basket with a flat bottom, wider at the top than at the bottom. These baskets are made in various sizes, from 8 quarts to 32 quarts. The 16-quart size is probably the best, and is most used. The baskets are sometimes covered with slat covers, but oftener are simply covered over with mosquito netting. Occasionally fancy peaches are packed in 10-quart, 14-quart or 16-quart Jersey baskets, and these are put up by twos in "pony" crates. In some sections of the country, notably West Virginia, this package is rather popular. The writer confesses himself unable to see anything really practical in it.

Jersey Peach Basket

The Climax, or Michigan basket. This is the third form of the peach basket. It closely resembles the popular climax grape basket. It is made of veneer, with a stiff handle. These are used in various sizes, but the 8-lb. and the 10-lb. sizes are much the commonest. These baskets are sometimes covered with slat tops, but oftener with mosquito netting. This package has the advantage of going direct to the consumer with the least possible trouble to him. It is a more expensive package to handle than either of the others.

Climax Peach Basket

Peaches are graded according to size and color. All peaches of any basket should be of the same size, and all first-grade peaches should be well colored. Two or three grades are made, as the character of the fruit may require or the fancy of the shipper dictate.

The fruit is usually graded in a packing shed, whither it is brought as fast as picked. In the shed it should be poured out on narrow tables for sorting. These ought to be padded to prevent bruising of the fruit. If several packers are to work together the tables should be divided into sections of convenient length. The tables usually slant toward the packers, which helps to roll the fruit toward them, and which also gives them a better view of the fruit. Considerable skill is required to sort and pack peaches rapidly and accurately; and well trained packers receive good wages.

Nowadays, when peaches are to be shipped any distance, they are usually forwarded in refrigerator cars. This is especially the practice in Georgia, Texas and California. Good refrigerator car service is now almost a necessity to the peach business, and has been the means of extending both the area of peach growing and the period of consumption very considerably.

Peaches may also be kept for a certain time in cold storage. Powell's experiments have shown that firm, well-colored fruit will keep from two to three weeks in a temperature of 32 degrees. It is possible to keep peaches even longer than this under exceptionally favorable conditions, but for commercial purposes even two weeks' storage is hardly to be generally recommended. Storage will often help, however, to tide over a temporary glut in the market; and such storage certainly furnishes a material addition to our equipment for handling the peach crop.

Plums

Plums ripen through a long season. This fact presents a certain difficulty in picking and shipping them. For home use plums should be allowed to hang on the trees as long as possible. They should be thoroughly ripe when picked. Even for shipping to market certain varieties are frequently picked too green. This is apt to be the case with the Damsons, German Prune, Fellenberg and similar varieties, which take on a heavy color long before they are really mature. On the other hand, some varieties are best picked for market at a period more or less in advance of maturity. The Burbank plum is an example. This variety can be picked a week before it is ripe, and will then mature in a satisfactory condition in a storage house or in a package. This plan of picking before the plums are fully ripe may often be resorted to with great advantage when plums are rotting badly. In this way a considerable portion of the crop may often be saved from rot.

Plums should be picked w'th the stems on, whenever that is possible. Many varieties, however, do not hold to the stems. In such cases the removal of stems at picking time does no harm except that it may injure the general appearance of the faced fruit to a limited degree.

Plums should be picked in the early morning if possible, while they are cool, and should be transferred at once to storage or to a cool place. If they are to be shipped to market they should be graded, packed, and sent off as expeditiously as possible.

A good many growers make a great mistake by not grading plums. It is customary with many fruit men, who are otherwise careful with such things, to send plums to market just as they come from the tree. Now the plum is essentially fancy fruit, and requires such special attentions as are always due a fancy article. Plums should not only be graded, but the best ones, at least when packed in small packages, should be carefully faced. In some cases it is even best to wrap the individual fruits in paper.

There is no standard package for plums. Each grower will choose his own package with reference to the fruit he has to ship and the demands of his market. The best California plums are usually sent to market in a special square box of wood veneer holding about two quarts. Many of the eastern growers have found the common quart box used for strawberries to be the most satisfactory for plums. The writer has used with much satisfaction the 3-lb. bail-less grape basket. The 4-quart bail-less basket, such as is used in Georgia peach carriers, is also entirely satisfactory for shipping plums. These three packages last named may be conveniently crated in the ordinary strawberry crate, and this makes a convenient and good package for shipment. Other packages which have been used for plums are the 5 and 10-lb. Climax grape basket with stiff handles; diamond splint basket in various sizes, and the Jersey peach basket, especially in the 8, 12, and 16-qt. sizes. For a nearby retail market for plums of ordinary quality the writer prefers the 16-qt. Jersey peach basket. For consignment to city markets, at least in the eastern states, the best results are secured with small packages, down to one quart, packed in small crates. Packages holding one-half bushel or less seem to find the most favor.

Plums are seldom held in cold storage; but in any case where a delay in marketing is desirable the benefits of cold storage may be adopted. The length of time which plums will keep in cold storage varies greatly. If they are soft, over-ripe, and affected with rot, it is hardly worth while to store them at all. On the other hand, such varieties as Fellenburg, Bradshaw, Grand Duke, etc., when in good condition, would doubtless keep without serious deterioration from one to two months in good storage.

We have never known of plums being shipped in carlots to distant markets. We have seen Mr. Hale, however, sending partial carloads in the same car with peaches from his Georgia orchard to New York. In such cases plums should be given the benefits of the refrigerator car service, just as peaches are.

Quinces

Quinces should not be picked until they are ripe and well colored. This direction seems so obvious that one would hardly believe how often it is disregarded. Green, unripe quinces are about as unattractive as anything that can be bought on a fruit stand. In order to get the fruit in a suitable condition for selling, it is often necessary to pick over the trees two or three times. Such extra pickings are well worth while.

When the fruit is picked, it is immediately sorted, packed, and sent to storage or market. Long storage is seldom profitable, since the demand for quinces comes nearly all at the time of the quince harvest.

The fruit should be very carefully graded since the market for quinces is always a fastidious one. Specimens which are at all bruised or soiled by fungus should be discarded and the remaining specimens graded according to size. The discarded fruit is not worthless, however. It makes excellent jelly, and is good even for preserving and canning. Of course, it will have to be sold at a lower price than first-grade fruit, but it will still bring a good revenue and will not damage the sale of the first-grade stuff.

It has been practiced in past years to ship quinces in apple barrels. Half barrels have sometimes been used. Neither of these packages is satisfactory. Both should be discarded. Quinces should always be sold in a small package. Twenty-pound baskets have been used by some growers with considerable success. The 16-qt. Jersey peach basket has been found satisfactory, especially where long shipments were not involved. In shipping any distance the bushel box one of the best packages. It has always been our experience further that it pays well to wrap good quinces in paper. This fruit shows very badly the effect of any bruise, and the paper largely prevents bruising.

The quince has often proved to be one of the most profitable fruits. The demand for it, however, is uncertain. No man should undertake to make his fortune on quinces unless he is up to the tricks.

Pears

Pears are very often picked before they are thoroughly ripe. In fact, this is the customary way. It is a question whether this custom is well founded or not, but nevertheless such has long been the practice. Some late dessert varieties may doubtless best be handled by picking them fairly early and putting them in a dark place to ripen. The somewhat common practice of picking Kieffer underripe and sending to storage with the expectation of ripening there is not so defensible. The experiments carried on by Powell show that Kieffer may be picked during a considerable season, at least three weeks in Delaware and Maryland. When pears are sent to storage, in any case they should be handled very carefully and should be stored as soon as possible after picking.

The pear is essentially, and in most cases practically, a fancy fruit, and is to be handled as such. The practice which was common a few years ago of sending Bartlett, Duchess, Anjou, Sheldon, Winter Nelis, and similar varieties to market in apple barrels is wrong. Fortunately during recent years it has been largely discontinued. Pears have sometimes been sent to market in baskets. The diamond splint baskets have been used, also Climax baskets, and even more commonly the New Jersey peach basket. Such packages, however, are not logical ones for pears. Although it has not been very extensively used, the bushel box is probably the best pear package under ordinary circumstances. The fruit should be carefully packed in these, usually each specimen being wrapped in paper. For fancy fruit half bushel boxes would be even better, although the market is not accustomed to them.

Pears will keep for a considerable time in cold storage. The length of practicable and profitable storage of course depends very largely on conditions, especially on the quality and condition of the fruit and upon the variety. Kieffer and Bartlett will keep well until after Christmas in good storage. The best temperature for holding pears seems to be 32 degrees.

The prices received for pears vary immensely. They run from nothing at all up to $3 a dozen for fancy fruit. Every one must have remarked that eastern markets are never supplied with good dessert pears. The bulk of the fruit stand trade is supplied with California stock, which is never attractive to eastern consumers. It is a rarity to see good home-grown pears offered in any of the markets east of the Rocky Mountains. On the face of it, this looks as though there was a good opportunity to make some money in pear culture. The men who have the soil and climate adapted to it ought to try it.

Cherries

In California, and in a very few places in the eastern states, sweet cherries are grown for market. These are handled in a manner quite different from the methods employed with sour cherries.

These sweet cherries are always a dessert delicacy. Frequently they are destined to be eaten out of hand. It is expected, therefore, that they will be sold in small quantities only. Thus they are put up in small lots and in fancy packages, and every effort is spent to make them look as attractive as possible. They are for what is known as the fruit stand trade.

It is a curious fact worth noting that sweet cherries are sold in essentially the same way on the continent of Europe. Whenever during the cherry season a train stops at almost any way station in France, Switzerland or southern Germany, girls and women come crowding around with little baskets or paper cones filled with ripe sweet cherries. These are sold to the passengers on the train at prices usually about equal to 15 or 20 cents a pound. The sweet cherries are sold in all the city markets of Germany, France and Switzerland at retail in the same way. In the handling of no other fruit are the markets of continental Europe and of North America so much alike as in the selling of sweet cherries.

The California cherries, which are the commonest of the sweet cherries in our American markets, now usually come in small shallow wooden boxes holding three or four pounds. The cherries are nicely sorted and are placed in these boxes in tiers and rows in exact geometrical order. This gives them a very showy appearance, especially when varieties of divers colors are worked together into some sort of pattern.

Sweet cherries from the eastern states are usually sent to market in quart strawberry boxes. While this is a good way, it is not so good as the California method, and it is a question whether even the eastern growers of sweet cherries would not find the more expensive packages and the more elaborate methods of packing somewhat more profitable.

Sour cherries, like Morello, Richmond and Montmorency, are more commonly grown in the eastern states, the central states and in Canada. Still the market for this luscious fruit is not by any means half supplied. The present practice is to send these sour cherries to market in quart strawberry boxes crated, just as strawberries are shipped. While the present conditions of under-supply prevail this method is very good. It may be worth considering, however, whether the use of Climax baskets in 5 or even 8-lb. sizes would not please many customers. The fact is that the best buyers of sour cherries want them for canning or preserving, not for immediate use as dessert. Such customers always want as much as five or eight pounds, and for them the Climax basket would be handier and more attractive than the quart strawberry cup. If the time ever comes when the supply catches up with the demand. as nearly as it has in the marketing of apples, for instance, we shall surely see larger packages used for sour cherries.

Strawberries

Whenever I see a great public economist (general manager to the government by his own appointment) telling how to regulate the trusts, how to handle the national currency, how to control all transportation matters, and how to reform things generally, I always think what fun it would be to see him trying to run a gang of strawberry pickers. In many ways it is harder to handle a large crop of strawberries than it is to run the government At any rate I am convinced that some of the men who are in the strawberry business are smarter than some of the men who are in Congress.

One of the most serious problems in the strawberry business is that of securing a suitable force of pickers. In the southern states growers naturally depend largely on negro labor. In the northern states women and children are looked to for the principal help. Near factory towns such help is usually most abundant, and such places are often chosen on that account for commercial strawberry growing. In some places Italian pickers are used; in other places colonies of Polanders serve the end;

but always and everywhere one must foresee this peculiar labor problem before he goes extensively into the cultivation of strawberries.

Help of the kind here discussed is naturally and necessarily unsatisfactory. The wandering bands of negroes who follow the picking season from South Carolina to New Jersey are seldom the best men and women of their color. In many towns it is the accepted rule that special policemen must be put on as soon as the strawberry pickers appear. The Italians and Polanders who go about picking strawberries are only less nomadic and irresponsible than the negroes. It has been found absolutely necessary in many places to adopt the rule that no picker shall be paid even a part of his or her wage until the end of the picking season. If a grower should be so kind-hearted or crazy as to pay his pickers on the first Saturday night of the season many of them would immediately get drunk on the money and all of them would move on to some other place, leaving him without any pickers on Monday morning.

Intelligent girls of 16 to 60 years old are said to make the best pickers, especially American or French girls. Some growers regard proper picking of so much importance that they take special pains to select only the best pickers. Usually such men pay wages somewhat higher than the average, or offer other inducements. One grower of my acquaintance, besides paying good wages, gives a big strawberry supper at the end of the season, at which his pickers are his guests. These strawberry suppers are said to be a howling success, and a picker would work a month in the rain rather than miss the season's fete.

Picking is usually piece work, and pickers receive from 1 to 2 cents a quart. The average is about 1½ cents. In the south the pay is sometimes as low as ½ to ¾ cents a quart.

Various methods have been tried of keeping account of the pickers' work, but the one now almost universally adopted is the punch-card system. Each picker is provided with a punch-card. When a picker has a certain number of baskets filled with fruit he delivers them to the foreman, and the foreman punches the picker's card with the number picked. The picker keeps these cards till the day of settlement, in most cases, and the grower pays what these punched cards call for. The great advantage of this system is that it leaves the picker in sole charge of the evidence of his work, and thus prevents any quarrels over the amount of fruit picked.

A similar plan requires two of these cards, and both are punched at one operation. Thus the picker and the foreman each has a record.

Strawberries are almost always picked into the quart baskets in which they are sold. In fields where the fruit is sorted before being sent to market this is still the practice, the quart baskets being the most convenient receptacle for picking and measuring the crop. When berries are sorted they are simply poured out of the boxes and sorted back into them again.

It is customary and advisable to provide each picker with a small tray holding six baskets of fruit. This tray has a light bail and four short legs. Such trays can be made for about 5 to 7 cents each, or can be bought ready-made of dealers in fruit packages.

We have referred above to the sorting of the fruit. Many growers practice this as a regular thing. Probably a greater number do not. The question of whether it will pay to sort or not must be settled by every grower for himself, and can be determined in a given case only by test. If there is an accessible market where an extra price can be secured for a fancy product, then grading the fruit will usually pay. If there is not, then grading is almost certainly a waste of effort. It is a noteworthy fact, however, that many of the best growers find that it pays them well to grade their strawberries, putting the best ones by themselves and facing up the baskets in attractive fashion.

The Strawberry Package

Strawberries are nearly always sold in quart boxes, baskets or cups. These are made of wood veneer or of paper. The waxed paper baskets are very attractive for a local trade, but do not ship so well as strong wooden boxes. These quart boxes are made in four sizes, viz.: (1) "full quarts," (2) "standard quarts," (3) "short quarts," and (4) "skin quarts." It is rather a remarkable commentary on the business that these terms, "short quarts" and "skin quarts," should be regularly used in the trade. The moral aspect of this question has often been discussed, but we believe it has never been fully ascertained whether the fruit-grower, the buyer or the consumer will have to suffer for it in the hereafter. Of the four sizes named the "standard quarts" are in commonest use, though some markets and some growers prefer the "short quarts."

Pint boxes are sometimes used for very fancy fruit or for long shipments. Fruit naturally carries better the smaller the package. But the pint package for strawberries is a very small item in the trade as a whole.

The quart boxes are always shipped to market in crates. Standard crates hold either 24, 32, 48 or

60 quarts. The intermediate sizes are most in demand. For fancy fruit or long shipments preference is usually given to the smaller crates, though this preference is not without exception. Some growers of great experience say that the 60-qt. crate is best for express shipping; and the reason given is that, while an express messenger can throw a 24-qt. crate half way across the platform, it requires two men to lift a 60-qt. crate. The heavy package therefore gets the most careful handling.

Strawberries are largely shipped to commission merchants, just as other fruits are consigned. The very perishable nature of the fruit, however, makes this method risky, so that as many growers as can do so prefer to depend on private agents or to sell direct to some buyer. In the large strawberry centers, like Ridgley, Md., or Oswego, N. Y., buyers always appear in numbers and bid for the crop as it is hauled to the railroad stations by the growers. Sometimes one method is best for the grower; sometimes another is. It all depends. The only generalization which can fairly be made is that this delicate fruit should be handled as promptly as possible and with the least possible hitch between grower and consumer. For this reason direct retail sales must always be the most satisfactory way of handling strawberries; and the best growers will always seek this method of sale, or will come as near to it as their curcumstances will allow.

The prices realized for the fruit vary immensely —perhaps more than with any other kind of fruit. Hothouse berries often bring $1 a quart—sometimes twice or three times that much. The first berries from Florida nearly always sell in northern markets at 50 cents a quart and upwards. On the other hand, growers in Maryland and Delaware at the rush season, are sometimes compelled to accept 3 to 5 cents a quart, or even less. The usual retail price in northern markets is 10 to 15 cents a quart, and growers realize usually from 8 to 12 cents.

Bush Fruits

Raspberries and blackberries are somewhat extensively handled in our American markets, but gooseberries and currants have nowhere nearly the comparative importance that they have in foreign markets. Raspberries and blackberries are usually picked and handled much the same as strawberries. They are almost always put up in quart boxes and shipped in crates, exactly like strawberries. Fine red raspberries, however, are more frequently packed in small—say, 1-pint—boxes, at least in the east. Indeed, this is a favorite way of handling them. The fruit, being rather soft, handles better in the small packages, and being rather high in price sells better in this way. Blackberries are never sold in these pint cups, so far as the writer knows.

The prices paid pickers for picking raspberries or blackberries are usually a trifle less than for picking strawberries. They run from one-half cent to one and a half cents a quart. The pickers are managed in the same way, and the accounts kept in like manner, usually on a set of punch cards.

Dewberries are handled in all ways like blackberries. In fact, when they reach the consumer they are blackberries. The retailers never call them dewberries.

Gooseberries, when sent to market at all, are usually shipped in the same quart boxes, put up in crates, just as strawberries are. There is a very small sale for gooseberries in this country, and it seems to be growing proportionately smaller. In the old world, where they grow gooseberries of a different sort, and allow them to ripen fully on the vines, they are one of the favorite fruits in the markets.

Currants have a better standing in this country, being used largely for jelly, and even for dessert by some enterprising housewives. Currants, too, are usually marketed in quart boxes, and are therefore usually shipped in crates like strawberries. Sometimes, however, they are shipped in 3-lb. or 5-lb. Climax baskets with handles, such as are used for grapes. This is an excellent package, if the fruit is firm enough to bear shipment without crushing. In local markets currants are sold in all sorts of packages, and in fact are often dealt out in bulk without any package at all. This method is not to be recommended in any case. If the currants are worth selling they are worth handling well.

Grapes

There are a great many different kinds of grapes grown in this country, but for commercial purposes the Concord may be considered the type of them all, and it also furnishes a large majority of the crop annually sent to market. Grapes grown under glass have to be handled very differently, but they are so seldom grown and marketed in America that we may fairly disregard them in this article.

In ripening the fruit, very different matters have to be considered in different parts of the country, and with different varieties. In the southwestern states care has to be taken that the fruit is not cooked on the vines, or not prematurely ripened by the excessive hot sun. In the northern states every effort has to be made to secure all the sunlight and heat possible. In some cases grapes fail to ripen altogether for lack of sufficient heat. Different varieties differ greatly in this respect. Catawba, for example, requires much more heat to ripen thoroughly than

Delaware does. But any variety should be thoroughly ripened on the vines. Unripe grapes do not ship nor keep any better than those fairly well ripened, and they certainly are not so well received by customers. One of the best ways of reducing the demand for grapes is to send them to market green and sour. In the northeastern states it is not uncommon to allow the fruit to hang on the vines after the leaves have fallen, thus securing ripe grapes when earlier picking would yield only sour and unpalatable fruit.

The fruit is picked with small scissors or pruning shears made for the purpose. These should be both small and strong. The scissors used for thinning out bunches are not very good for picking. In the field the grapes are picked into any convenient receptacle. Usually the best thing is the half bushel picking basket used for apples. In our own work we pick grapes into large shallow trays which nest up one above another, leaving a shallow air space between. These trays are carried with the grapes in them into the cooling room. The fruit remains in these trays from one to ten days, until it is sorted and packed for market. This method is used only on a comparatively small scale and for a local market.

Usually the baskets as picked in the field are delivered promptly to the packing house. Here the fruit is spread out on a narrow table before the sorters and packers (usually girls and women), by whom it is picked over and packed. All decayed, green and defective berries are cut out with sharp-pointed scissors, and the bunches are deftly and snugly stowed in the baskets.

The package which is almost universally used for grapes is the Climax basket. These are made in various sizes, the most popular being 3-lb., 5-lb., 8-lb.

and 10-lb. Of these the smaller sizes have the preference. We have found 3-lb baskets without handles entirely satisfactory in the local market, but they cannot be recommended for the general trade.

Good grapes, ripened without too much heat, yet hanging on the vines till the beginning of cool weather, can be stored almost as satisfactorily as apples. Hundreds of tons are held in "common" and "cold" storage every winter. In cold storage they should have a temperature of 33 degrees. Houses for common storage of grapes are made and operated exactly like those for the common storage of apples.

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